

A NEW SPECIES OF THE GENUS *NEANISENTOMON* (PROTURA, EOSENTOMATA, EOSENTOMIDAE) FROM SHAANXI, CHINA

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Abstract *Neanisentomon shaanicum* sp. nov. from Shaanxi Province, China is described in the paper. It is characterized by the absence of sensilla *b'*-1 and *c'* on foretarsus, with extremely long sensillum *d*, the chaetotaxy of urotergites V – VI (8/16) absent of seta *A3* and VII (6/16) absent of setae *A1* and *A3* and the female squama genitalis with distinct duck-head like caput processus. The updated key to the genus *Neanisentomon* is also presented.

Key words Protura, Eosentomidae, *Neanisentomon*, new species, China.

1 Introduction

The genus *Neanisentomon* Zhang and Yin, 1984 is characterized by the absence of sensilla *e* on foretarsus, willow-leaf shaped or spatulated *t*-2 and *f*1 and the chaetotaxy of urotergite VIII (6/8), seta *Pe* lacked. Up to now, only three species of *Neanisentomon* were described which are all endemic to China and mainly occurred in subtropical region (Zhang and Yin, 1984; Yin, 1999).

During the soil fauna survey of Northwestern China in 2006, plenty of specimens of Eosentomids were collected from Shaanxi Province. Among them, one species was identified and described as new to science.

2 Material and Methods

The specimens were collected by using Tullgren funnels. All specimens were mounted on the slides using Hoyer's medium and dried for three days in an oven at 60 °C. Specimens were identified and described under the Nikon phase contrast microscope (E600). Type specimens are deposited in Shanghai Entomological Museum (SEM), Institute of Plant Physiology & Ecology, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences.

3 Abbreviations

aa: anterior additional seta. d: dorsal sensillum. l: lateral sensillum. m: middle seta. p: posterior seta. pa: posterior additional seta. r: rostral seta. sr: subrostral seta. sp: subposterior seta. Other abbreviations: see the paper of Bu and Yin (2007).

4 Discussion

Eosentomata Yin, 1996

Eosentomidae Berlese, 1909

Anisentominae Yin, 1983

Neanisentomon shaanicum sp. nov. (Figs 1–12)

Holotype ♀ (intact, mounted in Hoyer solution) (No. S06100), from broad-leaved forest on Mt. Cuihua (33°59'N, 109°01'E; alt. 1 300 m), Xi'an, Shaanxi Province, China, 8 June 2006, collected by Dr. LUAN Yun-Xia, GAO Yan and BU Yun. Paratypes: 1 ♀ (No. S06101), 1 ♂ (No. S06102), same data as holotype.

Description. Adult. Body length 750 – 956 µm (*n* = 3).

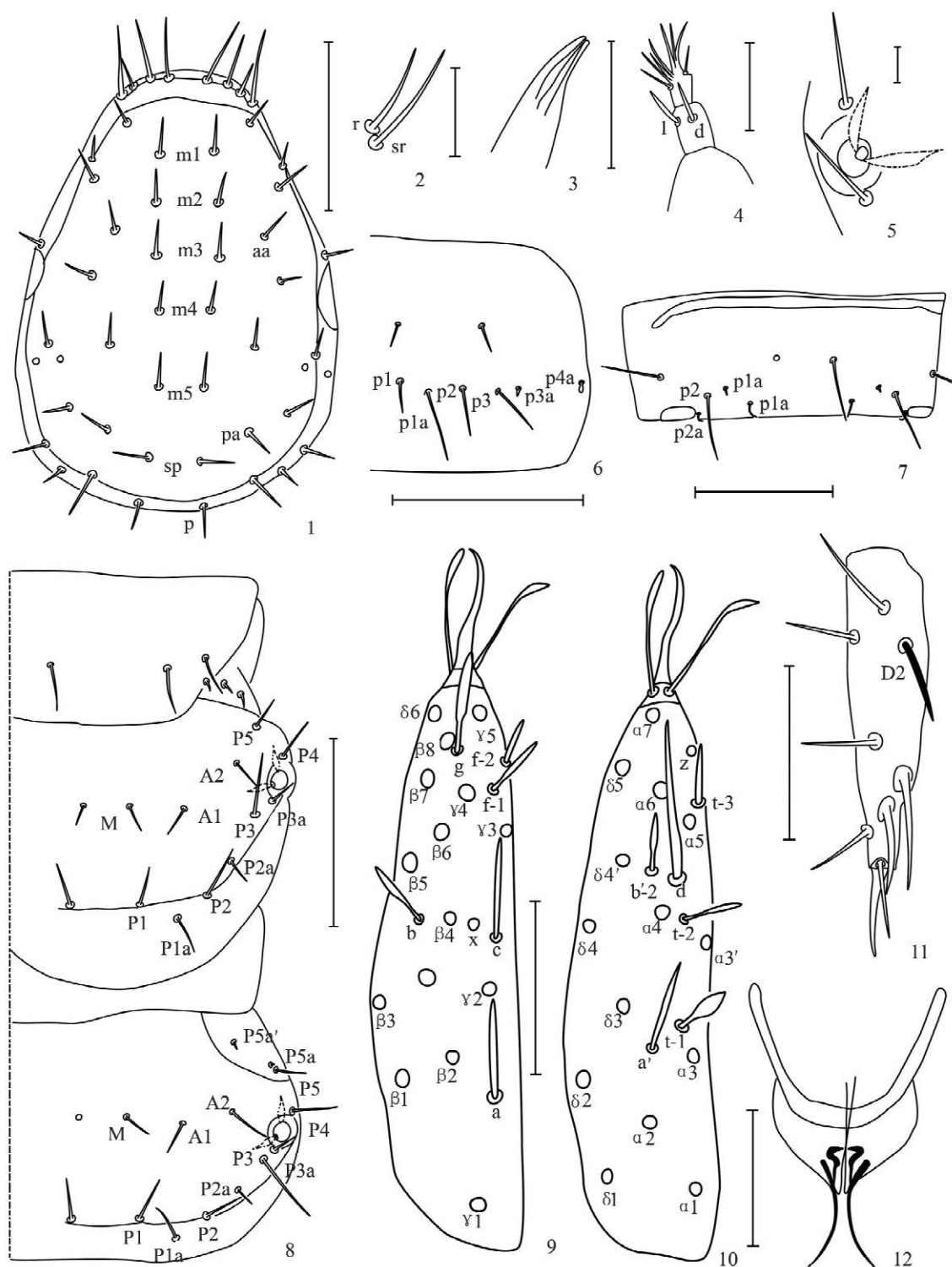
Head. Oval, length 97 – 100 µm, width 73 – 75 µm. Cephalic setae short. Subposterior seta 1.1 × length of posterior seta. Anterior additional and posterior additional setae also present (Fig. 1). Pseudoculus circular, width 8 µm. PR = 11 – 14. Clypeal apodeme distinct. Rostral setae alate, subequal to subrostral setae (Fig. 2). Mandibles with three distinct apical teeth (Fig. 3). Maxillary palpus with two subequal sensilla (Fig. 4). Digits of galea well-developed, median and inner equal, shorter and thicker than outer digit.

Thorax. Chaetotaxy shown in Table 1. Tracheal camerae short and broad, slim at the apex. Spiracle diameter 5 – 6 µm (Fig. 5). On mesonotum and metanotum, *P1a* setiform, situated posterior to the row of *P1* and *P2*, *P2* relatively long, length ratio of *P1*:*P1a*:*P2* on mesonotum as 1.2:1.0:1.4. Three little setae present on the lateral pleuron between pronotum and mesonotum. Metanotum with very short setae *P5a* and *P5a'*, *P5a* adhere to *P5* (Fig. 8). Sternites of thorax without pores.

Foretarsal length (Figs 9–10) 65 – 69 µm, claw length 12 µm, TR = 5.5 – 5.8; empodium subequal to claw, EU = 1.0; dorsal sensillum *t*-1 short, spindle-like,

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Figs 1 – 12. *Neanisentomon shaanicum* sp. nov. 1. Head, dorsal view. 2. Rostral (r) and subrostral (sr) setae. 3. Mandible. 4. Maxillary palpus. 5. Spiracle. 6. Urotergite I. 7. Urotergite VIII (holotype). 8. Part of pronotum, mesonotum and metanotum. 9. Foretarsus, exterior view. 10. Foretarsus, interior view. 11. Tarsus III. 12. Female squama genitalis. Scale bars: 1, 6–8 = 50 μm , 2–4 = 10 μm , 5 = 5 μm , 9–12 = 20 μm .

closer to $\alpha 3'$ than to $\alpha 3$, BS = 0.75–0.96; $t2$ short, clavate; $t3$ short, linear. Exterior sensilla a and c slim, subequal to each other; b short, spatulate, slightly surpassing base of $\beta 5$; d broad at base and extremely long, its apex reaching base of $\alpha 7$; e absent;

$f1$ short, spatulate at the end; $f2$ short, linear; g spatulate; Interior sensillum a' robust, broad in the middle; $b'-1$ and c' absent; $b'-2$ short and spatulate. Middle tarsal length 33–35 μm , claw length 8–9 μm . Hind tarsal length 40–41 μm , claw length 10 μm .

Table 1. The chaetotaxy of *Neanisentomon shaanicum* sp. nov.

	Dorsal		Ventral	
	Formula	Composition of setae	Formula	Composition of setae
Thorax				
I	4	1, 2	$\frac{6-2}{6}$	<i>A1</i> , 2, 3, <i>M</i> <i>P1</i> , 2, 3
II	$\frac{6}{16}$	<i>A2</i> , 4, <i>M</i> <i>P1</i> , 1 <i>a</i> , 2, 2 <i>a</i> , 3, 3 <i>a</i> , 4, 5	$\frac{6-2}{6}$	<i>A1</i> , 2, 3, <i>M</i> <i>P1</i> , 2, 3
III	$\frac{6}{20}$	<i>A2</i> , 4, <i>M</i> <i>P1</i> , 1 <i>a</i> , 2, 2 <i>a</i> , 3, 3 <i>a</i> , 4, 5, 5 <i>a</i> , 5 <i>a'</i>	$\frac{6-4}{8}$	<i>A1</i> , 2, 3, <i>M1</i> , 2 <i>P1</i> , 1 <i>a</i> , 2, 3
Abdomen				
I	$\frac{4}{12}$	<i>A1</i> , 2 <i>P1</i> , 1 <i>a</i> , 2, 3, 3 <i>a</i> , 4 <i>a</i>	$\frac{4}{4}$	<i>A1</i> , 2 <i>P1</i> , 2
II – III	$\frac{10}{16}$	<i>A1</i> , 2, 3, 4, 5 <i>P1</i> , 1 <i>a</i> , 2, 2 <i>a</i> , 3, 4, 4 <i>a</i> , 5	$\frac{6}{4}$	<i>A1</i> , 2, 3 <i>P1</i> , 2
IV	$\frac{10}{16}$	<i>A1</i> , 2, 3, 4, 5 <i>P1</i> , 1 <i>a</i> , 2, 2 <i>a</i> , 3, 4, 4 <i>a</i> , 5	$\frac{6}{10}$	<i>A1</i> , 2, 3 <i>P1</i> , 2, 2 <i>a</i> , 2 <i>a'</i> , 3
V – VI	$\frac{8}{16}$	<i>A1</i> , 2, 4, 5 <i>P1</i> , 1 <i>a</i> , 2, 2 <i>a</i> , 3, 4, 4 <i>a</i> , 5	$\frac{6}{10}$	<i>A1</i> , 2, 3 <i>P1</i> , 2, 2 <i>a</i> , 2 <i>a'</i> , 3
VII	$\frac{6}{16}$	<i>A2</i> , 4, 5 <i>P1</i> , 1 <i>a</i> , 2, 2 <i>a</i> , 3, 4, 4 <i>a</i> , 5	$\frac{6}{10}$	<i>A1</i> , 2, 3 <i>P1</i> , 2, 2 <i>a</i> , 2 <i>a'</i> , 3
VIII	$\frac{6}{8(9)^*}$	<i>M2</i> , 3, 4 <i>P(c)</i> , 1 <i>a</i> , 1 <i>a'</i> , 2, 2 <i>a</i>	$\frac{2}{7}$	<i>A1</i> <i>Pc</i> , 1, 1 <i>a</i> , 2
IX	8	1, 2, 3, 4	6	1, 2, 3
X	8	1, 2, 3, 4	6	1, 2, 3
XI	4	3, 4	8	1, 2, 3, 4
XII	9		12	

* Posterior seta *Pc* absent in holotype (No. S06100), present in paratype (No. S06101, S06102).

Empodia of middle tarsi and hind tarsi long. Basal seta (seta *D2*) of hind tarsus as spine shape (Fig. 11).

Abdomen. Chaetotaxy shown in Table 1. Abdominal tergite I with 2 pairs of anterior setae (*A1*, *A2*), with 6 pairs of posterior setae (*P1*, *P1a*, *P2*, *P3*, *P3a*, *P4a*), *P3a* and *P4a* specialized as short sensillum-like, similar to that of *E. xingjiangense* Bu et Yin, 2007 (Fig. 6). Urotergites II – IV with 5 pairs of anterior setae, V – VI with 4 pairs of anterior setae (*A1*, *A2*, *A4*, *A5*), VII with 3 pairs of anterior setae (*A2*, *A4*, *A5*). Seta *P1a* on urotergites I – VI long, longer than *P1*; *P2a* on urotergites II – VI subequal to *P1a*, short on urotergite VII. *P1a'* on urotergite VIII as sensillum-like, slightly near to *P2* than to *P1a*, *P2a* short and curved, *Pc* absent in holotype (No. S06100) (Fig. 7), present in paratype (No. S06101, S06102). Urosternite VIII with one pair of anterior setae and 7 posterior setae, IX and X with 3 pairs of setae respectively. Urosternites IX and X with single medial pore each, XI without pores. Segment XII with two anterior medial pores on tergite and one medial pore on sternite.

On female squama genitalis, caput processus as duck-head shape and curved towards the median edge of stylus, filum processus slim and long (Fig. 12).

Etyymology. The species is named after the short

name of Shaanxi Province (Shaan) where the type specimens were collected.

Distribution. China (Shaanxi).

Diagnosis. *Neanisentomon shaanicum* sp. nov. is characterized by the sensilla on foretarsus which with extremely long sensillum *d*, sensilla *b'-1* and *c'* lacked, and the chaetotaxy of urotergites, seta *A3* lacked on V – VI, setae *A1* and *A3* lacked on VII, female squama genitalis with distinct caput processus as duck-head shape. It can be distinguished from other species from the chaetotaxy of metanotum, urotergites V – VII and XI, urosternites IX – X, length of sensillum *d* on foretarsus and female squama genitalis.

Remarks. The chaetotaxy of urotergite VIII of *N. shaanicum* sp. nov. is varied, e. g., *Pc* absent in holotype (6/8), but present in paratype (6/9) which is similar to the species of genus *Pseudanisentomon* Zhang et Yin, 1984. The female squama genitalis with distinct duck-head like caput processus is also similar to *Pseudanisentomon*. But the lack of sensilla *b'-1* and *c'* on foretarsus was only occurred in few species of genus *Pseudanisentomon*, on the contrary, it is very common in genus *Neanisentomon*. Also, simultaneously lacking of setae *A1* and *A3* on urotergite VII was never occurred in *Pseudanisentomon*. So we place present new species in genus *Neanisentomon*.

The four known species of the *Neanisentomon* can be distinguished by the following key.

Key to the world species of the genus *Neanisentomon* Zhang et Yin, 1984.

1. Urosternites IX and X with 4 setae respectively 2
 Urosternites IX and X with 6 setae respectively 3
2. Urotergite VII with 3 pairs of anterior setae (A2, 4, 5)
 *N. guicum* Zhang et Yin, 1944
 Urotergite VII with 4 pairs of anterior setae (A1, 2, 4, 5)
 *N. yuenicum* Zhang et Yin, 1984
3. Sensillum *d* on foretarsus broad at the base, reaching base of seta $\alpha 7$;
 b'-2 present *N. shaanicum* sp. nov.
 Sensillum *d* on foretarsus normal, reaching base of *t*-3; *b'*-2 absent
 *N. tienmunicum* Yin, 1989

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REFERENCES

- Bu, Y and Yin, W-Y 2007. The Protura from Xinjiang, Northwestern China. *Zootaxa*, 1 437: 29 – 46.
- Bu, Y and Yin, W-Y 2007. Two new species of *Hesperentomon* Price, 1960 from Qinghai Province, Northwest China (Protura, Hesperentomidae). *Acta Zootaxonomica Sinica*, 32 (3): 508 – 514. [动物分类学报]
- Yin, W-Y 1999. Fauna Sinica. Arthropoda. Protura. Science Press, Beijing, China. 510pp.
- Zhang, Z-Y and Yin, W-Y 1984. A revision of the species and genera of the subfamily Anisentominae (Protura: Eosentomidae). *Entomotaxonomia*, 6 (1): 59 – 72.

中国陕西省新异蜣属一新种记述 (原尾纲, 古蜣目, 古蜣科)

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摘 要 记述了采自陕西省翠华山的新异蜣属 1 新种, 即陕新异蜣 *Neanisentomon shaanicum* sp. nov.。新种主要特征为: 前足跗节感器 *b'*-1 和 *c'* 缺失, 感器 *d* 极长大; 腹部第 V ~ VI 节背板缺少前排刚毛 *A*3, 毛序为 8/16, 第 VII 节背板缺少前排

刚毛 *A*1 和 *A*3, 毛序为 6/16; 雌性外生殖器具有明显的鸭头状的头片。该新种可以通过前足跗节感器 *d* 的长度和雌性外生殖器等特征与已知种类区分。文中同时列出了新异蜣属的世界种类检索表。

关键词 原尾纲, 古蜣科, 新异蜣属, 新种, 中国.

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